

## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT



(PCT Article 36 and Rule 70)

Rec'd PCT/PTO 17 MAR 2005

Applicant's or agent's file reference CMF40570/PCT		<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/IT 02/00594	International filing date (day/month/year) 17.09.2002	Priority date (day/month/year) 17.09.2002	
International Patent Classification (IPC) or both national classification and IPC G07D7/12			
Applicant O.R.M.A.G. SPA			

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 6 sheets, including this cover sheet.  
  
☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.18 and Section 607 of the Administrative Instructions under the PCT).  
  
 These annexes consist of a total of 4 sheets.

3. This report contains indications relating to the following items:
  - ☒ Basis of the opinion
  - ☐ Priority
  - ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
  - ☒ Lack of unity of invention
  - ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
  - ☐ Certain documents cited
  - ☐ Certain defects in the international application
  - ☐ Certain observations on the international application

Date of submission of the demand  16.04.2004	Date of completion of this report  04.02.2005
Name and mailing address of the international preliminary examining authority:   European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tlx 31 651 epo nl Fax +31 70 340 - 3016	Authorized Officer  Neville, D  Telephone No. +31 70 340-2892  

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**International application No. **PCT/IT 02/00594****I. Basis of the report**

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

**Description, Pages**

1, 3-10 as originally filed  
2 received on 31.12.2004 with letter of 24.12.2004

**Claims, Numbers**

1-14 received on 16.04.2004 with letter of 15.04.2004

**Drawings, Sheets**

1/7-3/7, 5/7-7/7 as originally filed  
4/7 received on 16.04.2004 with letter of 15.04.2004

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).  
☐ the language of publication of the international application (under Rule 48.3(b)).  
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority in written form.  
☐ furnished subsequently to this Authority in computer readable form.  
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.  
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:  
☒ the claims, Nos.: 15  
☐ the drawings, sheets:

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**IV. Lack of unity of invention**

1. In response to the invitation to restrict or pay additional fees, the applicant has:

- ☐ restricted the claims.  
☒ paid additional fees.  
☐ paid additional fees under protest.  
☐ neither restricted nor paid additional fees.

2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is

- ☐ complied with.  
☐ not complied with for the following reasons:

4. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:

- ☒ all parts.  
☐ the parts relating to claims Nos. .

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****1. Statement**

Novelty (N)	Yes: Claims	1-14
	No: Claims	
Inventive step (IS)	Yes: Claims	1-8,14
	No: Claims	9-13
Industrial applicability (IA)	Yes: Claims	1-14
	No: Claims	

**2. Citations and explanations**

**see separate sheet**

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**EXAMINATION REPORT - SEPARATE SHEET****Re Item IV****Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

Prior-art document DE1953542 discloses the preamble of claim 1. The characterising features of claim 1 and the features of claims 9 and 14 are neither the same nor corresponding and represent, respectively, solutions to three different problems: (1) holding objects to be tested stationary with respect to a cylinder according to the preamble of claim 1; (2) preventing light-receiving parts of a test apparatus from saturation; (3) homogenising illumination of objects to be tested.

Therefore the application does not satisfy Rules 13.1 and 13.2 PCT.

The claims corresponding to the three inventions are as follows:

- 1) 1-8: Gripping means for objects to be tested.
- 2) 9-13: Means for preventing saturation of sensor elements.
- 3) 14: Method for homogenising illumination of objects to be tested.

Since further fees have been paid this international preliminary examination report will cover all claims.

**Re Item V****Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Reference is made to the following documents:  
D1: DE 19 53 542 A (MAKO-APPARATEBAU FRITZ BREDE) 6 May 1971 (1971-05-06)  
D2: US-A-3 860 118 (JAMES, ET AL.) 14 January 1975 (1975-01-14)  
D3: EP-A-0 581 102 (SIEMENS NIXDORF INFORMATIONSSYSTEME) 2 February 1994 (1994-02-02)  
D4: US-A-5 280 333 (WUNDERER) 18 January 1994 (1994-01-18)  
D5: US-A-5 498 879 (DE MAN) 12 March 1996 (1996-03-12)
2. The amendments to the claims met the requirements of Art. 34(2)(b) PCT.
3. Document D1 discloses the preamble of claim 1, as mentioned under item IV. The features of the characterising part of claim 1 are concerned with the gripping of

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**EXAMINATION REPORT - SEPARATE SHEET**

objects to be tested onto the cylinder of the preamble. Because means in the form of a belt or belts are disclosed in D1 for holding notes to be tested against the roller there is no indication reason for the skilled person to seek any solution to the problem of gripping objects to be tested in any other than by means of belts. Further, the gripping means set out in the characterising part of claim 1 are quite different from belts and the skilled person would not, starting from any presently available prior-art document, in particular D1, arrive at the subject-matter of claim 1 without inventive activity. Similarly the subject-matter of dependent claims 2-8 is also therefore new and inventive.

Although documents D2 and D3 illustrate gripping means for notes, those of D2 do not form part of a rotating roller and would not be readily adaptable to result in those of claim 1 and those of D3 are used for a different purpose (temporarily storing a stack of banknotes for dispensing) and would thus also not be readily adaptable to result in those of claim 1.

4. Document D4 discloses (column 4, lines 43-46, column 6, lines 5-19, figures 1,4) a device similar to that of claim 9. Sensor (15) of D4 (see figure 1) receives light from illumination means (3,5,9) and transmitted through banknote (1), the sensor and illumination means being on the same optical axis (see figure 1). Figure 4 of D4 shows an embodiment of the illumination means (3,5,9), whereby the central part of its exit edge (9) is metal-coated, which partially shades the sensor from direct light from the illumination means. The arrangement disclosed in D4 is thus the same as that of claim 9 except that no lens is present, but the use of lenses in such optical banknote testing devices is well known as are their effects (e.g. focusing). Further, the lens of claim 9 does not contribute in any important way to the solution of the problem, that of shading sensitive elements from overmuch light. Although this problem is not expressly mentioned in D4, it is evidently solved by the device of D4, as the skilled person would understand, since the sensor (15) is in line with the metal-coated central area on the exit edge of the illumination means and the light source (5) itself. Consequently, the subject-matter of claim 9 does not involve an inventive step (Art. 33(3) PCT).

The subject-matter of dependent claims 10-13 does not include any feature which is not either known from D4 or D1 (transport features, cylinder) or well known in optical devices (semi-transparent features). As a result the subject-matter of claims 10-13 does not involve an inventive step (Art. 33(3) PCT).

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5. Document D5 discloses (column 7, lines 46-55) a device which provides uniform illumination in an apparatus for testing notes, the preferred embodiment being on in which the device is optically diffractive. Neither the generic device of D5 nor the particular example discussed therein, nor any other presently available prior-art device is such that the subject-matter of claim 14 is anticipated directly or rendered obvious.

**Re Item VII****Certain defects in the international application**

1. The independent claims 1, 9, 14 are not in the two-part form set out in Rule 6.3(b) PCT with those features known in combination from document D1 (claim 1), D4 (claim 9) or D5 (claim 14) as the basis for the preamble (Rule 6.3(b)(i) PCT) and with the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT). The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

The relevant background art disclosed in the document D4 is not mentioned in the description (Rule 5.1(a)(ii) PCT).

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- (62) compromising on the quality or excessively increasing the manufacturing difficulty and related costs.

Another feature, which, as may be easily guessed, affects the quality of the inspecting operation results, concerns the actual acquiring system.

Normally, the support image is acquired through electronic cameras; in particular line scan cameras performing a line-by-line scanning of each support.

Image acquisition may be performed basically using two techniques: by reflection or by transparency, depending on which security support feature is to be scanned and tested.

In a reflection system, the camera and the light source are placed on the same side relative to the support to be inspected, as shown in Fig. 1.

As it can be seen in the figure, a light source 1, through a wave-guide system (for example fibre optics) 2 and a collimation device 3, projects a bright band 1a focussed onto a support 4 to be inspected (also called target). On the same side of the lighting system there is also an acquisition camera 5, "reading" the light reflected by the support in order to transform it into an analogical or digital signal to be analysed with known techniques.

By varying the relative angle of the camera and of the lighting system relative to the support 4, it is possible to acquire images in different conditions, i.e. with specularly reflected light or with diffused light.

This arrangement is used to inspect features on the recto and verso of a support, such as a banknote.

In a transmitted light system, on the other hand, the camera and the lighting device are placed substantially opposite to each other relative to the support to be inspected, the latter being made to pass between the former. This arrangement is used to transparency-inspect specific features, such as watermarks, security threads and so on.

DE1953542 discloses an inspecting system according to the preamble of claim 1. US-A-5280333 discloses an inspection system where an illuminator device is composed of fluorescent plates having different light sources; coating elements are provided to obtain superimposed light lobes apt to shift the maximum brightness some distance away from the exit edge of said fluorescent plates. US-A-5498879 discloses a device which provides uniform illumination in an apparatus for testing notes, in which the device is optically diffractive.

Some of the drawbacks afflicting the prior art systems are indicated below.

The cameras commonly used in this field are black and white or RGB line scan cameras, requiring a simple line of light, of sufficient intensity and quality, to be generated, in order to allow a correct acquisition. The quantity and quality of the light is a critical factor in this type of appliances due to the high support transportation

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## CLAIMS

1) Inspecting system for thin security supports, of the type wherein a transportation device is apt to transport said thin support past an image acquiring device, wherein said transportation device is a rotating cylinder (10) provided with transparent sectors (10a, 10b) of a size at least equal to that of the portion of the security support to be inspected and wherein a transparency inspecting device is placed partially inside and partially outside the cylinder so that the electromagnetic inspecting beam is intercepted by said supports held lying onto said transparent sectors, characterised in that said transportation cylinder comprises a gripping system for said security support having a pivoting gripping element (11) cooperating with at least a radially movable block (12), the gripping point of the security support being able to be lowered relative to the nominal rotational diameter thereof so as not to interfere with calibration blades (13) fixedly placed in proximity of the inspection axis and strictly adjacent to said rotating cylinder.

2) Inspecting system as in claim 1), wherein said transparent sectors are covered, on the security support bearing side, by a thin removable transparent protective layer.

3) Inspecting system as in any of the preceding claims, wherein an optical path is defined between an illuminating device (3) of said inspecting system and an acquisition camera, said path comprising lens (21) which focuses the light source onto a focal point (F), through which said thin security support is made to pass as a target, along the optical path at or upstream of said lens (21) shading means (22) being provided apt to define a cone of shade (5) only in correspondence of sensitive elements of said camera (5).

4) Inspecting system as in claim 3), wherein said shading means (5) is a semitransparent material layer due to which, in the absence of a target to be inspected, said camera (5) does not exceed the saturation threshold which would otherwise corrupt the quality of the image.

5) Inspecting system as in claim 4), wherein said semitransparent material is easily replaceable.

6) Inspecting system as in claims 4) or 5), wherein said semitransparent material, in the absence of a target, allows the camera at most to reach but not exceed the saturation threshold.

7) Inspecting system as in any one of the claims 3) to 6), wherein said shading

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means is so transparent and sized as not to absorb more than 10% of the light intensity hitting the target.

8) Inspecting system as in any one of the claims 3) to 7), wherein said illuminating device has reflecting surfaces at its side ends.

9) Transparency inspection system for security supports, of the type wherein an illuminating device (3) is placed at the opposite side of an acquisition camera (5) relative to a security support to be inspected, characterised in that said illuminating device is placed substantially on the same optical axis of said acquisition camera (5), said path comprising lens (21) which focuses the light source onto a focal point (F) through which said security support is made to pass as a target and in that it has along the optical path at or upstream of said lens (21) partial-shading means (22) apt to define a cone of shade (S) at camera sensitive elements.

10) Inspecting system as in claim 9), wherein said shading means (22) is a semitransparent material layer such as, in the absence of a target to inspect, said camera does not exceed the saturation threshold, which would otherwise corrupt the quality of the image.

11) Inspecting system as in claim 10), wherein said semitransparent material is easily replaceable.

12) Inspecting system as in claims 10) or 11), wherein said semitransparent material, in the absence of a target, allows the camera at most to reach but not exceed the saturation threshold.

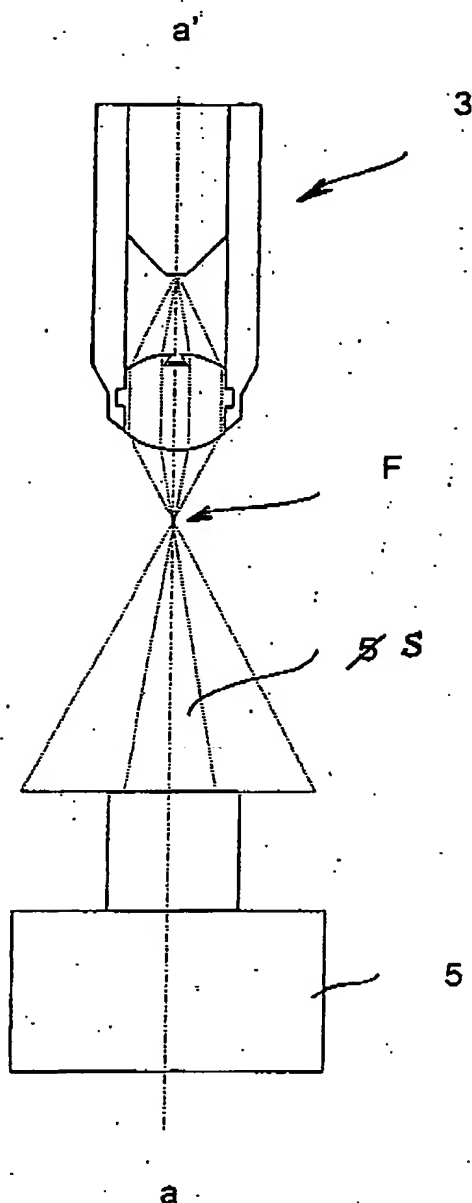
13) Inspecting system as in any one of the claims 9) to 12), wherein said security support is made to pass past the camera adhering to a transportation cylinder (10) having transparent sectors at least at the portion of the support to be inspected, said camera or said illuminating device being fixed inside the transportation cylinder.

14) Method for homogenising the distribution of light on a target in a value sheet inspecting system, of the type comprising the application of a homogenising filter between the light source and the target, characterised in that said filter is made by printing a pattern of more or less spaced and/or wide lines or dots onto a substantially transparent means; on the basis of a previous target reading, performed with said inspecting system.

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**Fig. 4B**

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